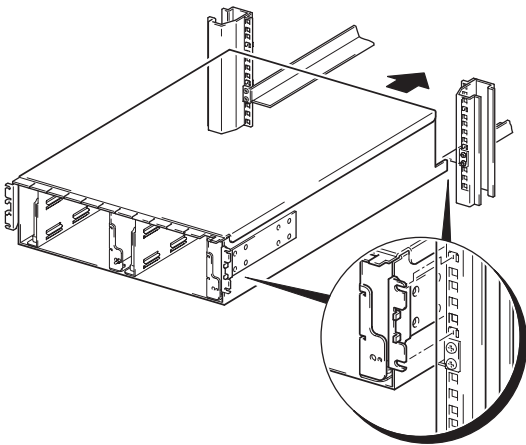


hp StorageWorks tape array 5300

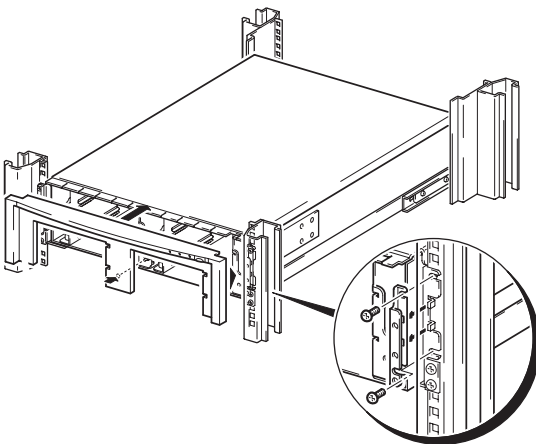
default rail fittings

The HP Tape Array 5300 is now shipped ready to install in HP 7000/9000/10000 series racks and compatible, third-party Rittal racks (racks with a square hole profile). The default rail fittings on the tape array are as shown below and not as shown in Steps 4a/b and 5a/b of the Getting Started Guide.

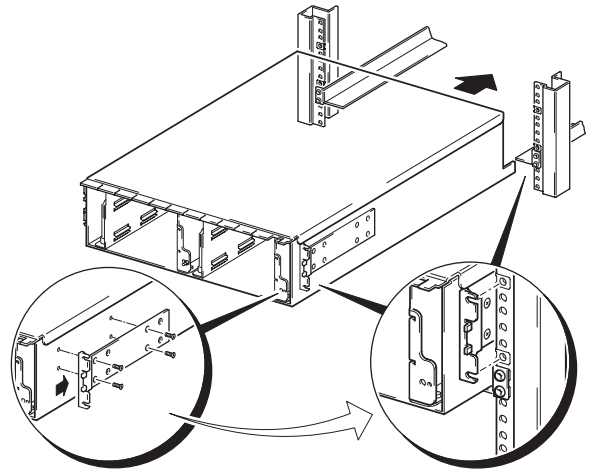
1. HP 7000/9000/10000series racks and Rittal racks (Default)



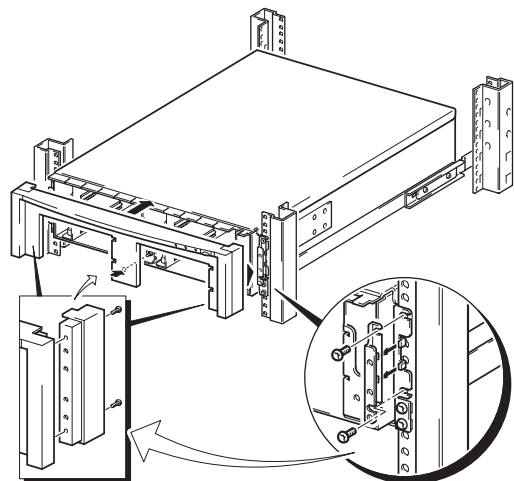
2.



1. HP rack system/e type racks



2.



HP Tape Array 5300 - overview

For further details, see:

<i>Introduction</i>	page 3
<i>Step 1: Adjust the length of the support rails</i>	page 5
<i>Step 2a: Install M5 clip nuts (racks with round hole profile)</i>	page 7
<i>2b: Install M6 cage nuts (racks with square hole profile)</i>	page 9
<i>Step 3a: Install support rails (racks with round hole profile)</i>	page 11
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<i>Step 4a: Install the tape array enclosure (round hole profile)</i>	page 15
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<i>Step 5a: Install the front bezel (round hole profile)</i>	page 19
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<i>Step 6: Install the tape drive module</i>	page 23
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Product Details

Write your HP Tape Array 5300 details here so you can find them easily if you need them

Serial number:		
Date purchased/installed:		
SCSI ID:	Bay 1	
	Bay 2	
	Bay 3	
	Bay 4	

Introduction

The HP Tape Array 5300 is designed as a low-cost backup solution that merges high performance of backup and recovery in one compact, modular, and easily serviced package.

The HP Tape Array 5300 supports up to four half-height, or two full-height tape drive modules and up to four independent SCSI buses. The backup capacity of one high-density enclosure depends on the type of tape drive installed; refer to the documentation shipped with your tape drive modules for full details.

Features

The HP Tape Array 5300 provides:

- High-density storage: the HP Tape Array 5300 supports up to four half-height tape drive modules in the footprint (3U).
- Rack optimized design: the HP Tape Array 5300 is designed for installation in HP and other compatible 19-inch racks. This guide describes how to install the tape array into HP rack system/e type racks (racks with a round hole profile) and HP 7000/9000/10000 series and compatible, third-party Rittal racks (racks with a square hole profile).
- Easy serviceability: the tape drive modules are offline hot-swappable¹ for easy in-rack servicing without downtime.
- Supportability: the HP Tape Array 5300 supports full-height and half-height tape drive modules, across a full range of technologies and capacities.

High availability upgrade kit option

The HP Tape Array 5300 has a single fan and power supply unit. An optional upgrade kit is available to fit an additional fan and power supply unit to provide high-availability, hot-swap functionality whereby should one unit suffer component failure, the other unit will maintain correct operation.

Tools needed

You need the following tools for the installation procedure:

- Large or small Philips screwdrivers depending on the type of rack.
- T15 and T25 Torx® wrenches (provided).
- Template (provided) for marking the clip nut or cage nut location on the rack columns.

SCSI cables and terminators

You will also need to order the correct size SCSI cables and terminators for your tape drive modules to suit your particular application (see page 25). Cable and terminator options are listed at the HP support web site <http://www.hp.com/support/tapearray>. **You should ensure you have these cables and terminators before starting the installation.**

1. Offline hotswap is defined as the ability to plug and unplug drive modules with the power still connected, but not while data transfers are taking place onto other drives on the same SCSI bus.

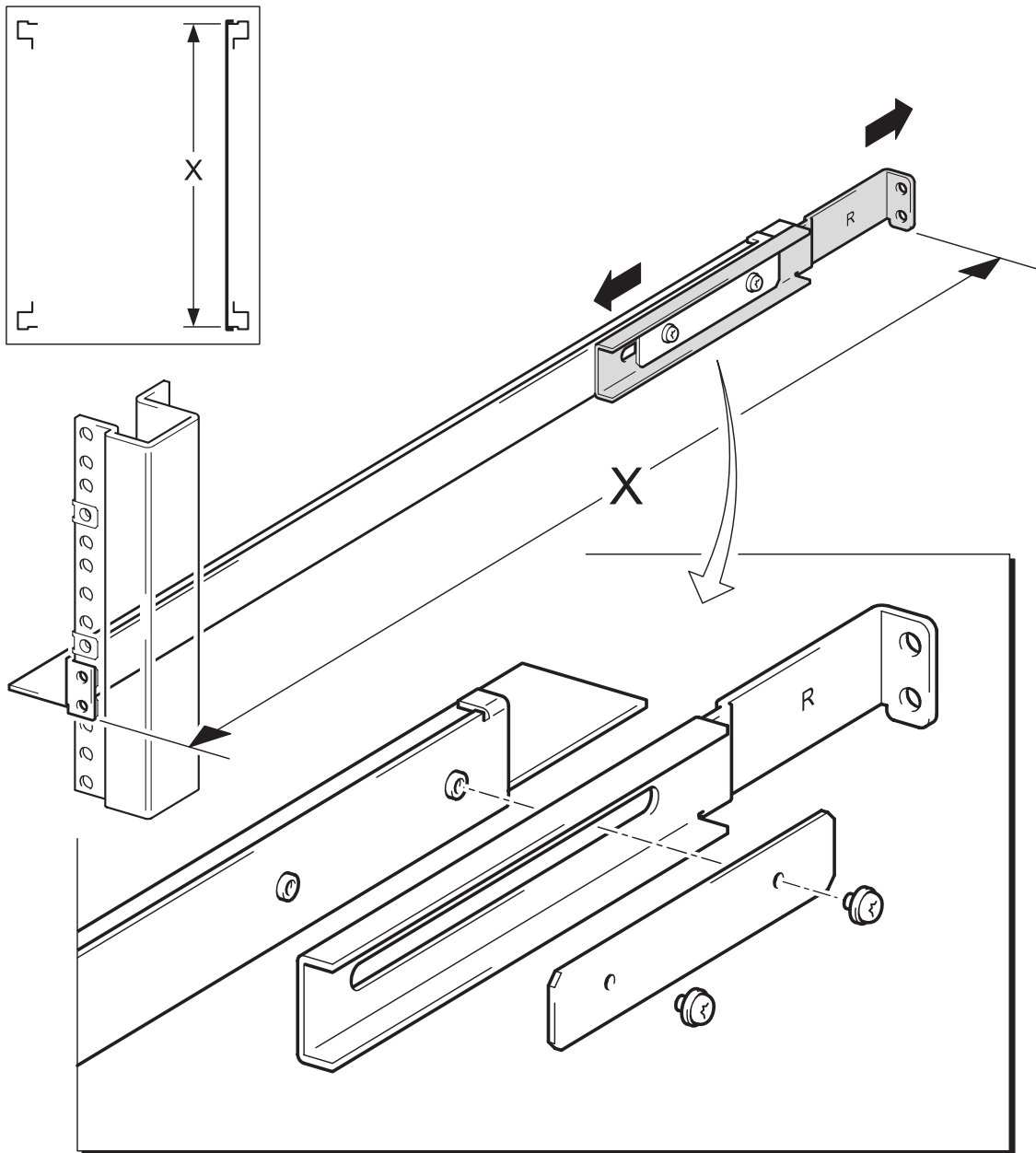


Figure 1: Adjust the length of the support rails

Step 1: Adjust the length of the support rails

The length of the side support rails needs adjusting to fit different rack types. To aid installation the telescopic section of the support rail is inscribed with two lines, stamped "A" and "B", and is normally aligned, as summarized in the following table.

Scribe line	Nominally fits
A	HP 7000/9000/10000 series racks and compatible, third-party Rittal racks (racks with a square hole profile and depth of 29 inches)
B	HP rack system/e type racks (racks with a round hole profile and a depth of 28 inches)

However, the length of the support rail should always be checked, as described below, and may need adjusting to take account of the rack's manufacturing tolerances.

- 1 Open the front and rear door panels of the rack. In most cases, adequate access to install the HP Tape Array 5300 can be gained from the front and rear of the rack without having to remove the side panels. It is not necessary to disconnect the power to other items of equipment already installed in the rack but care must be taken to avoid damaging or disturbing connections.

Warning The HP Tape Array 5300 may need to be installed in a rack system that already contains other items of equipment where the power is turned on. Take care when working alongside other equipment in the rack.

- 2 Assemble the side support rails as shown on Figure 1. Align the length to scribe line A or scribe line B, as shown in the table above. Finger tighten the two securing screws.
- 3 Carefully offer up a support rail with the telescopic section of the rail towards the rear of the rack. It is much easier if this is done by two persons. The telescopic section is stamped with the letter "R" for the support rail to be installed on the right hand side of the rack, when the rack is viewed from the front, and with the letter "L" for the left hand side of the rack.
- 4 Compare the length of the rail with the distance between the front and rear rack columns.
- 5 Check that the length is correct to allow the flange on the front of the rail to fit over the front rack column and the flange at the rear of the rail to fit over the rear rack columns, see Figure 1.

If adjustment is not required, use the T15 Torx® wrench to tighten the two screws. Proceed to install the HP Tape Array 5300 as described on page 7 (racks with round hole profile) or page 9 (racks with square hole profile).

- 6 If adjustment is required, loosen the two securing screws on the support rail's mounting plate.
- 7 Extend the telescoping section of the rail to the maximum length allowed by the slotted hole.
- 8 Re-measure the support rail against the rack columns and adjust to the correct length. Take care to maintain the measured length of the rail and remove the rail from the rack.
- 9 Use the T15 Torx® wrench to tighten the two screws.
- 10 Repeat paragraphs 3 to 9 for the other support rail.

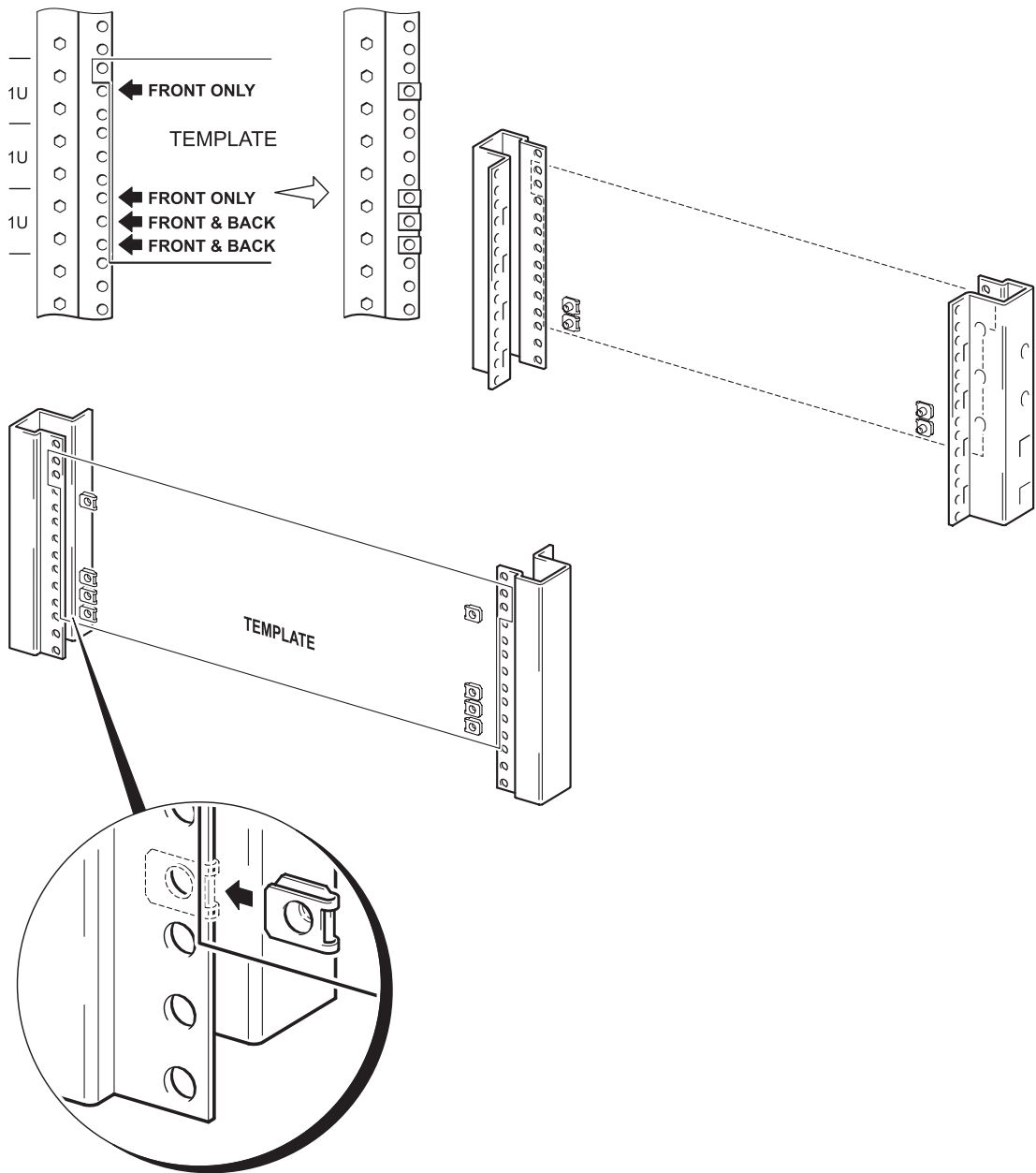


Figure 2a: Install M5 clip nuts (round hole profile)

Step 2a: Install M5 clip nuts (racks with round hole profile)

Note The HP Tape Array 5300 can be installed in HP series/e racks, which have round profile cutouts in the vertical mounting rack column. The round profile cutouts accept M5 mounting clip nuts.

- 1 Locate the installation template supplied with your HP Tape Array 5300.
- 2 Align the template with the front columns of the rack so that the '#' markings on the template align with the required EIA unit¹ numbers on the rack column. Make sure the template is in the position you require for installing the HP Tape Array 5300.

Note The round profile holes in the rack's front columns are not uniformly spaced.

- 3 Place the first eight clip nuts, as shown in Figure 2a, at the locations indicated by the black arrows marked either "FRONT ONLY" or "FRONT & BACK" on the template (four clips to each side). This is done by sliding the clip nut over the hole of the rack column until it snaps into place.
- 4 Note which numbered EIA units were used on the front columns.
- 5 Repeat paragraph 2 and 3 for each of the rear columns using the lower arrow locations indicated on the template marked "FRONT & BACK" (two clips to each side).

1. Vertical space within a rack is measured by industry-standard EIA units. (1 EIA unit = 1.75 inches or 44.5 millimeters.) Equipment height is also specified in EIA units. System configuration is made easier by counting EIA from the base of the rack. EIA units are numbered on the vertical columns of many (but not all) rack systems.

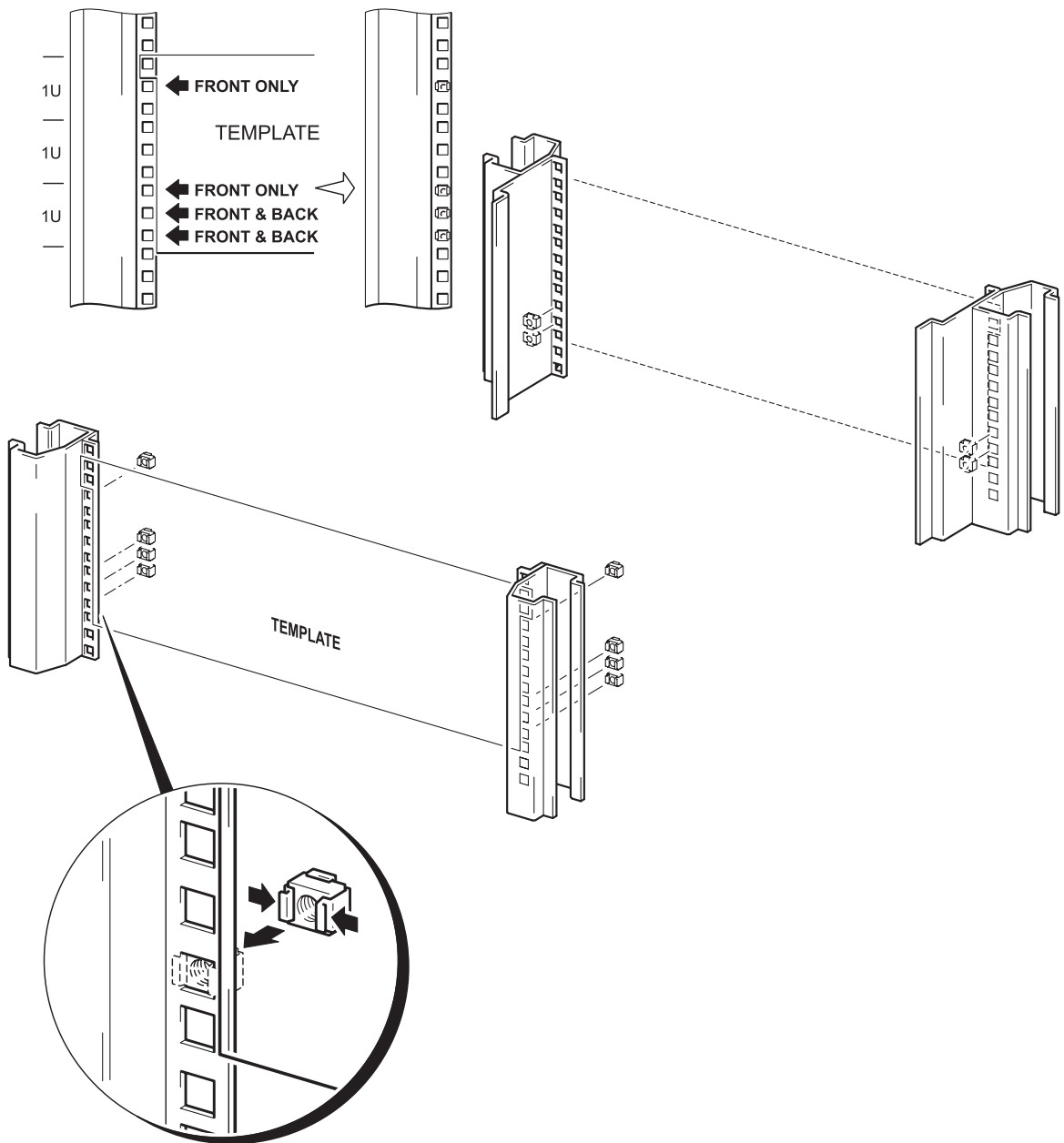


Figure 2b: Install M6 cage nuts (square hole profile)

Step 2b: Install M6 cage nuts (racks with square hole profile)

Note The HP Tape Array 5300 can be installed in HP 7000/9000/10000 racks or in compatible, non-HP manufactured Rittal racks, by vendors such as IBM, which have square profile cutouts in the vertical mounting rack column. The square profile cutouts accept M6 mounting cage nuts.

- 1 Locate the installation template supplied with your HP Tape Array 5300.
- 2 Align the template with the front columns of the rack so that the '#' markings on the template align with the required EIA unit¹ numbers on the rack column. If EIA numbers are not given, carefully count the holes in the cabinet columns from the base of the cabinet, and align the template arrows to the holes chosen. Make sure the template is in the position you require for installing the HP Tape Array 5300.

Note The square profile holes in the rack's front columns are not uniformly spaced.

- 3 Place the first eight cage nuts, as shown in Figure 2b, at the locations indicated by the black arrows marked either "FRONT ONLY" or "FRONT & BACK" on the template (four cage nuts to each side). This is done by squeezing the sides of the cage nut and inserting it into the square hole from the inside of the rack column. The cage nuts are spring loaded. If necessary, use the blade of a screwdriver to snap it into place.
- 4 Note which numbered EIA units were used on the front columns, or count up an equal number of holes from the base.
- 5 Repeat paragraph 2 and 3 for each of the rear columns using the lower arrow locations indicated on the template marked "FRONT & BACK" (two cage nuts to each side).

1. Vertical space within a rack is measured by industry-standard EIA units. (1 EIA unit = 1.75 inches or 44.5 millimeters.) Equipment height is also specified in EIA units. System configuration is made easier by counting EIA from the base of the rack. EIA units are numbered on the vertical columns of many (but not all) rack systems.

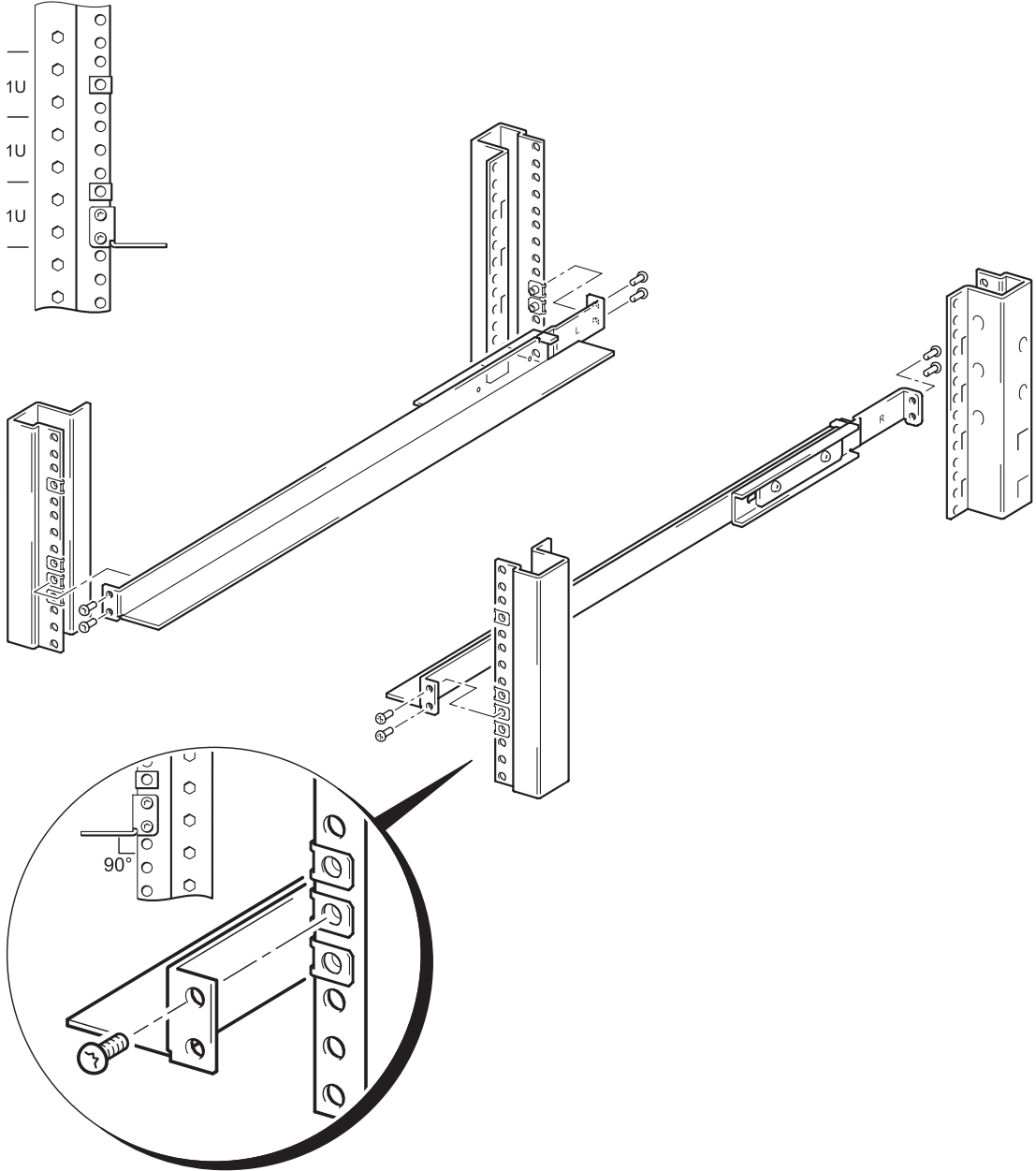


Figure 3a: Install support rails (round hole profile)

Step 3a: Install support rails (racks with round hole profile)

- 1 Refer to Figure 3a. Position a support rail so that the flange at the rear of the rail locates over the rear rack column and the two holes in the rail flange align with the two clip nuts. It is much easier if this is done by two persons.
- 2 Insert the M5 screws. Partially finger-tighten the screws only at this stage.
- 3 Position the rail so that the flange at the front of the rail locates over the front rack column and the two holes in the rail flanges align with the bottom two clip nuts.
- 4 Use the T25 Torx® wrench to tighten the M5 screws. Ensure the rail is secured so that the support flange is at 90 degrees to the vertical rack column.
- 5 Tighten the screws on the rear rack columns.
- 6 Repeat paragraphs 1 through 5 for the opposite side of the rack.

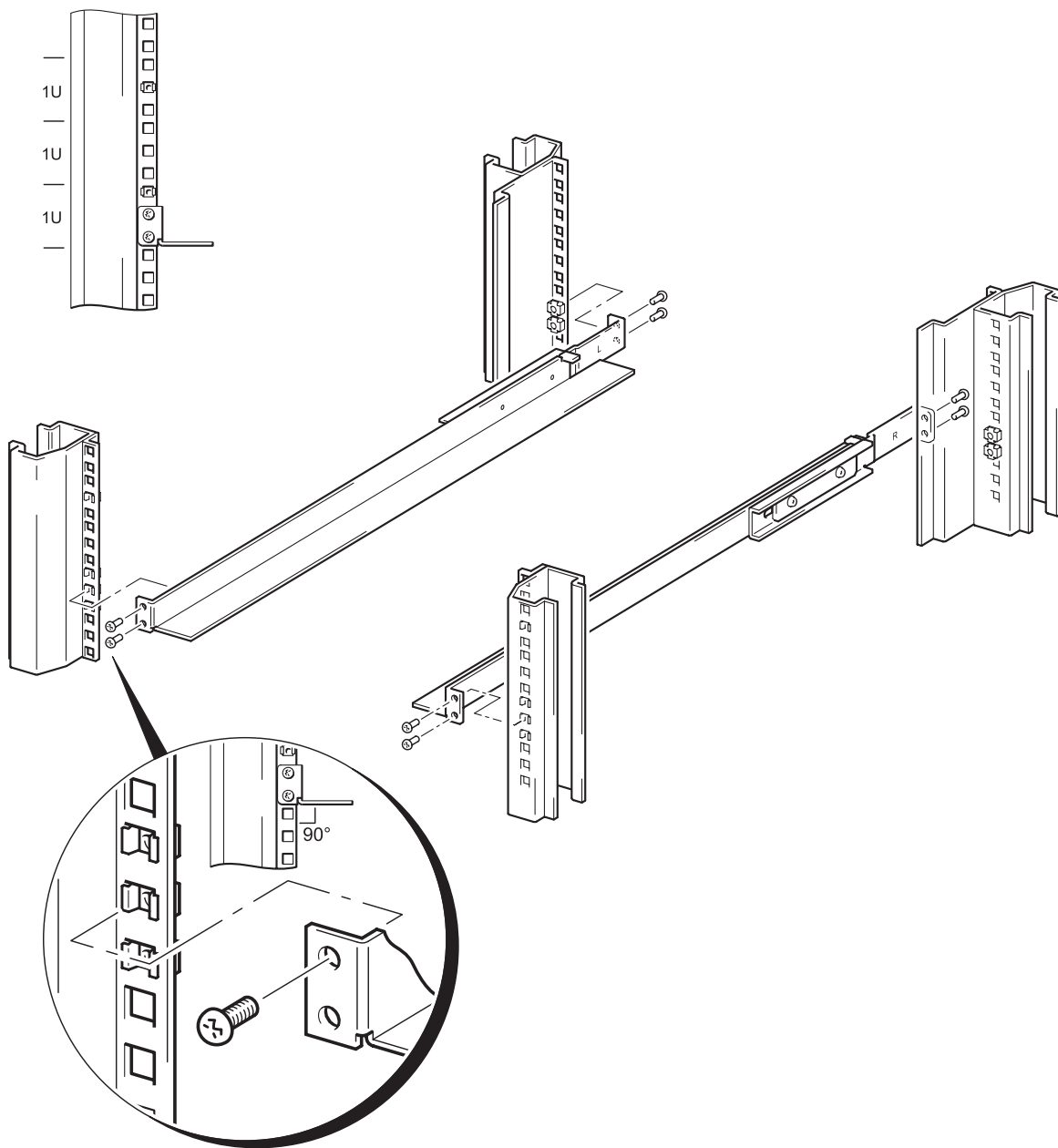


Figure 3b: Install support rails (square hole profile)

Step 3b: Install support rails (racks with square hole profile)

- 1 Refer to Figure 3b. Position a support rail so that the flange at the rear of the rail locates over the rear rack column and the two holes in the rail flange align with the two cage nuts. It is much easier if this is done by two persons.
- 2 Insert the M6 screws. Partially finger-tighten the screws only at this stage.
- 3 Position the rail so that the flange at the front of the rail locates over the front rack column and the two holes in the rail flange align with the bottom two cage nuts.
- 4 Use a Pozidriv® or large Philips screwdriver to tighten the M6 screws. Ensure the rail is secured so that the support flange is at 90 degrees to the vertical rack column.
- 5 Tighten the screws on the rear rack columns.
- 6 Repeat paragraphs 1 through 5 for the opposite side of the rack.

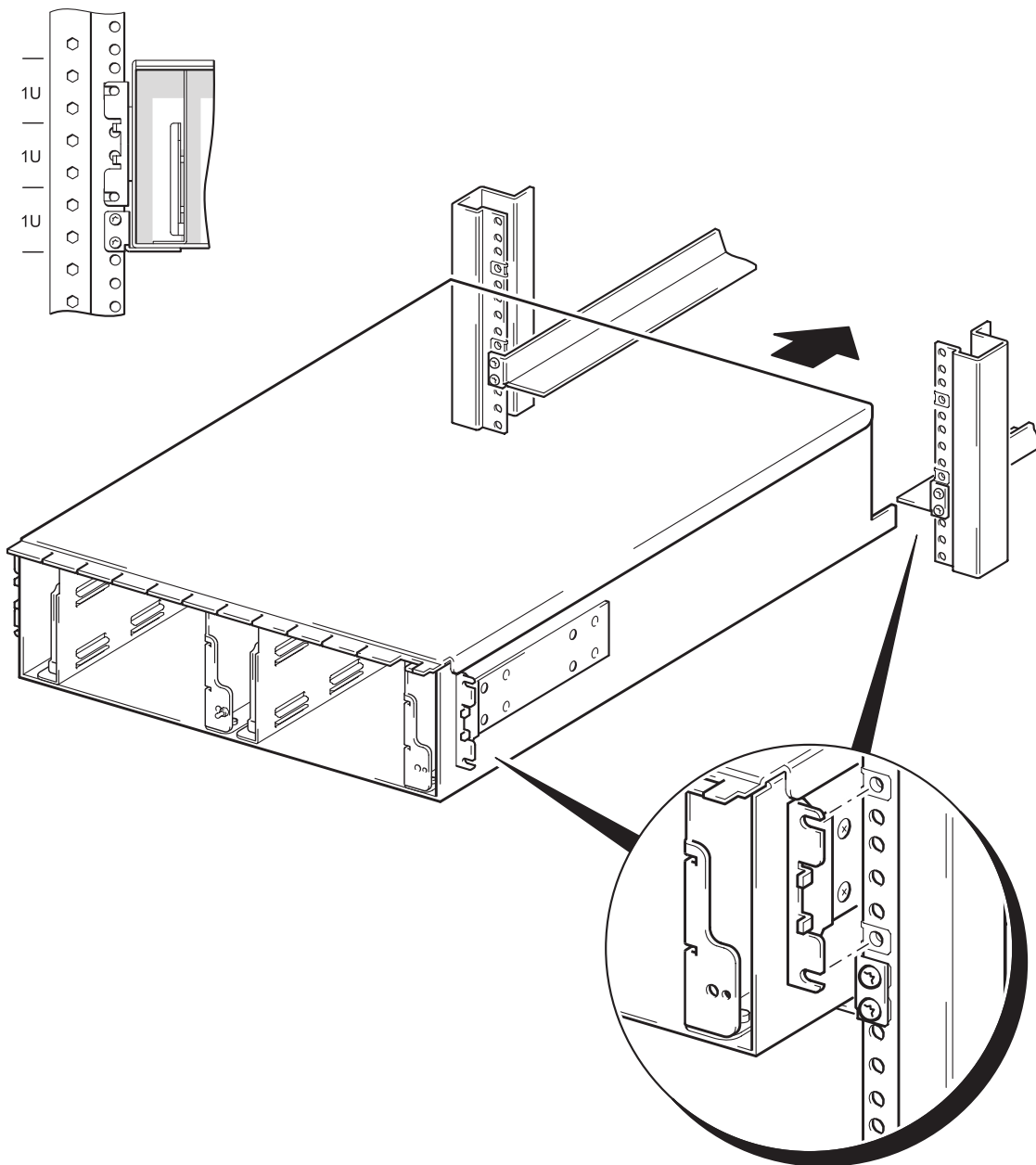


Figure 4a: Install the tape array enclosure (round hole profile)

Step 4a: Install the tape array enclosure (round hole profile)

Warning The HP Tape Array 5300 is heavy (13 kg or 28.7 lbs). It is recommended that two people should install it. Prior to installing your tape array in a rack, extend the rack's anti-tip stabilizer and utilize any anti-tip ballast.

To minimize the weight and to prevent personal injury, do not install tape drive modules into the HP Tape Array 5300 until the tape array is installed in the rack.

- 1 With an assistant, lift the tape array into the rack and rest the back end of the array on the front of the support rails.
- 2 Push the tape array back into the rack along the rails until the extended base plate sections of the unit slot under the tabs located on the rails. Push fully in until the flanges of the side mounting brackets are flush with the front rack columns.

The two mounting slots on the side mounting bracket's flange should now line up with the upper and lower clip nuts located on the front column, as shown in Figure 4a.

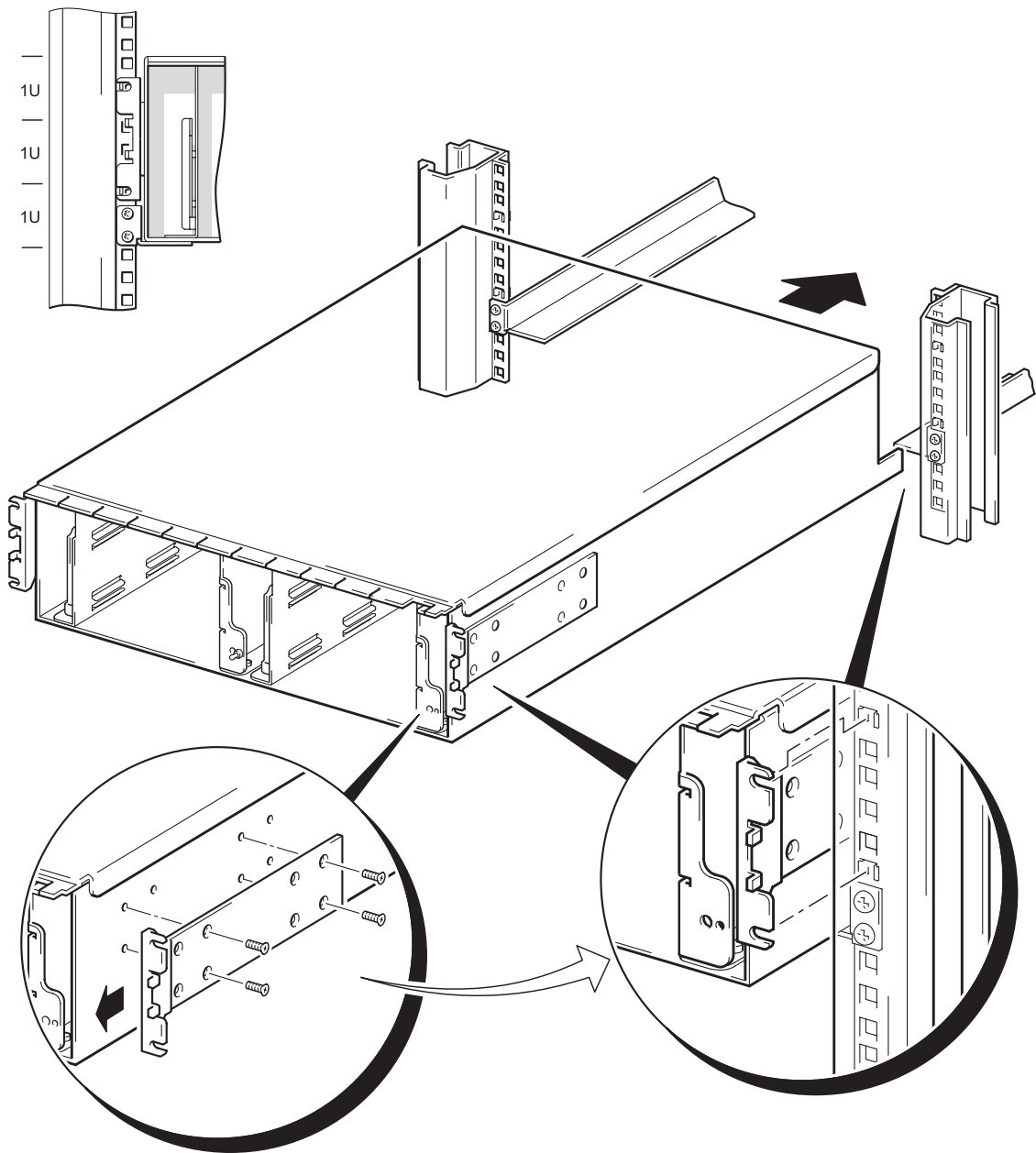


Figure 4b: Install the tape array enclosure (square hole profile)

Step 4b: Install the tape array enclosure (square hole profile)

Warning The HP Tape Array 5300 is heavy (13 kg or 28.7 lbs). It is recommended that two people should install it. Prior to installing your tape array in a rack, extend the rack's anti-tip stabilizer and utilize any anti-tip ballast.

To minimize the weight and to prevent personal injury, do not install tape drive modules into the HP Tape Array 5300 until the tape array is installed in the rack.

Adjusting the position of the side mounting brackets

When installing into HP 7000/9000/10000 series and some non-HP racks, for example IBM, the position of the side-mounting brackets have to be adjusted. This is because the front columns of these racks are positioned further back from the front face of the rack.

- 1 Remove the screws on the side-mounting brackets on the side of the tape array.
- 2 Slide the mounting bracket forward to align the second set of holes in the mounting brackets with the holes in the tape array's chassis.
- 3 Secure with screws.

Installing the HP Tape Array 5300

- 1 With an assistant, lift the tape array into the rack and rest the back end of the array on the front of the support rails.
- 2 Push the tape array back into the rack along the rails until the extended base plate sections of the unit slot under the tabs located on the rails. Push fully in until the flanges of the side mounting brackets are flush with the front rack columns.

The two mounting slots on the side mounting bracket's flange should now line up with the upper and lower cage nuts located on the front column, as shown in Figure 4b.

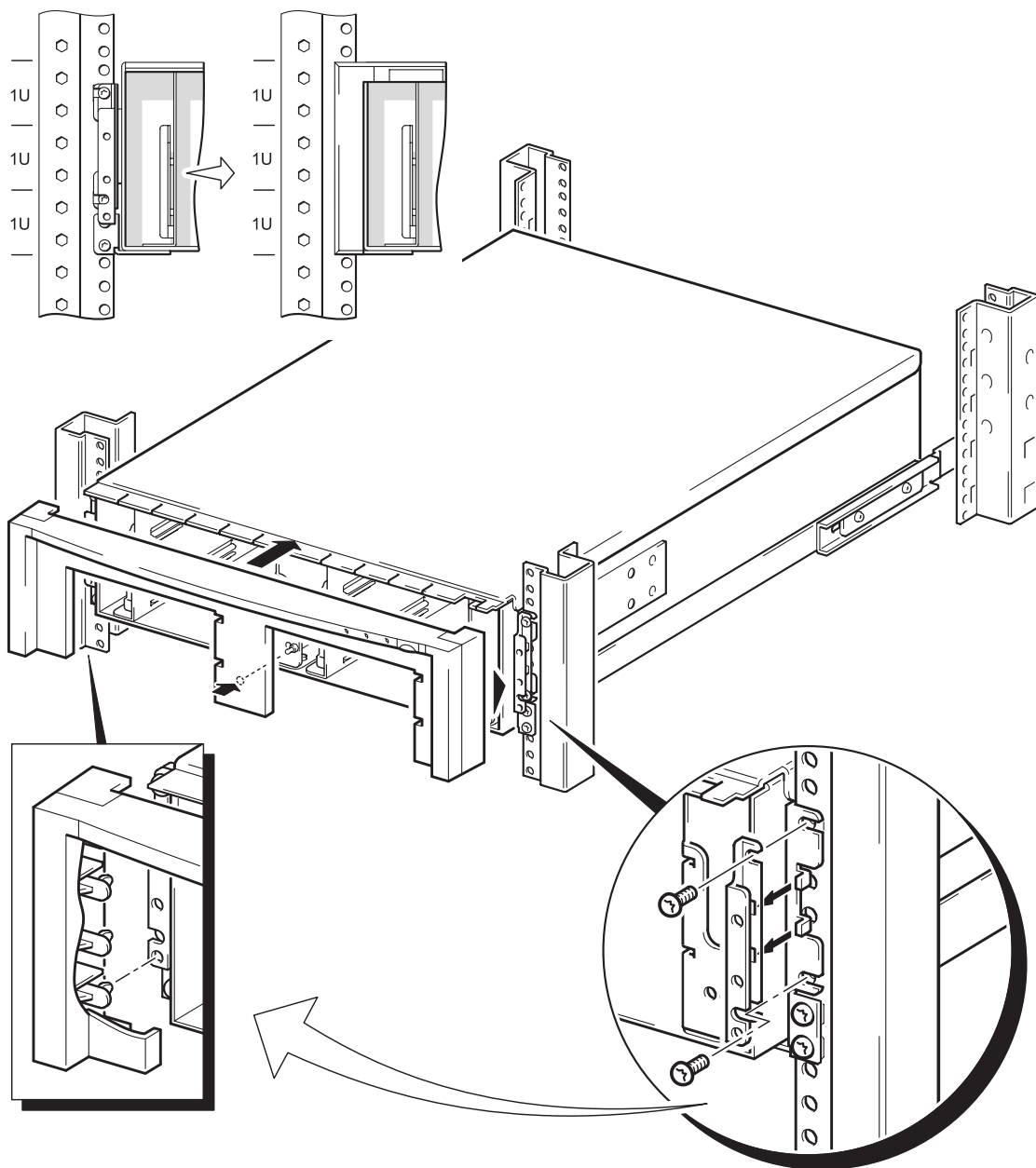


Figure 5a: Install the front bezel (round hole profile)

Step 5a: Install the front bezel (round hole profile)

- 1 Locate the two bezel brackets. The bezel bracket to be fitted to the right hand side of the rack, when the rack is viewed from the front, is stamped with the letter "R". Likewise, the bezel bracket to be fitted to the left hand side of the rack, when the rack is viewed from the front, is stamped with the letter "L".
- 2 Turn a bezel bracket so that the stamped letter is correctly orientated and is facing the front, and the indents face outward towards the side of the rack as shown on Figure 5a.
- 3 Attach the bracket to the flange of one of the side mounting brackets.
The two rectangular holes on the bezel bracket hang on the two teeth of the side mounting brackets, as shown in Figure 5a.
- 4 Insert two M5 mounting screws through the slotted holes on the rear flange of the bezel bracket, so that the screws pass through the aligned slotted holes in the side mounting bracket and locate into clip nuts installed on the front rack column.
- 5 Repeat paragraphs 2 through 4 with the other bezel bracket.

Caution Take care not to damage the LEDs on the top right hand side of the enclosure when fitting the front bezel.

- 6 Align the lower three mushroom snaps on both bezel endcaps with the holes on the bezel brackets (the top mushroom snap on each side is not used). Ensuring that the centre locating lug is also aligned and that the top edge of the bezel slides over the top front edge of the enclosure, snap the bezel into place. (No screws are required.)

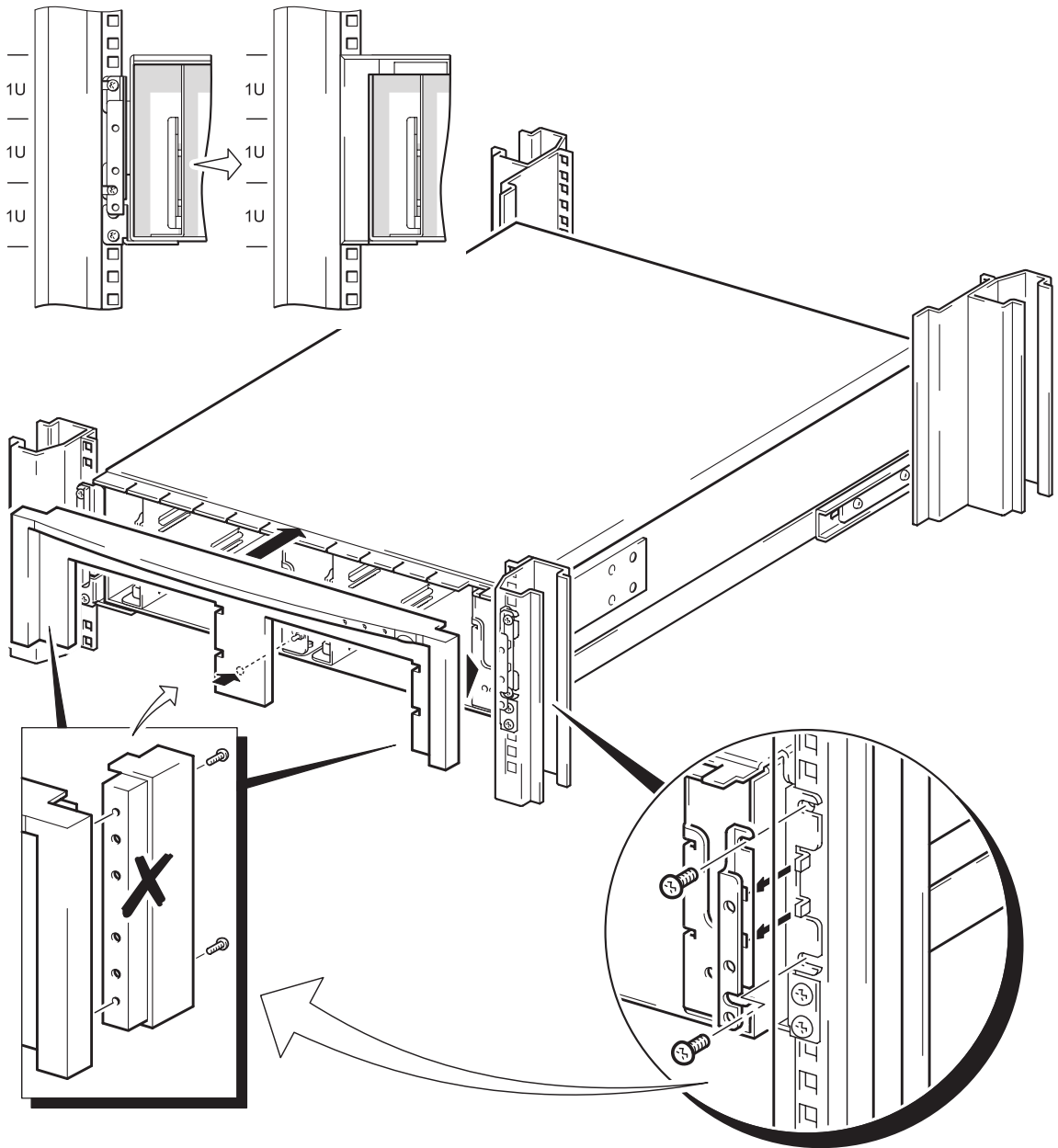


Figure 5b: Install the front bezel (square hole profile)

Step 5b: Install the front bezel (square hole profile)

- 1 Locate the two bezel brackets. The bezel bracket to be fitted to the right hand side of the rack, when the rack is viewed from the front, is stamped with the letter "R". Likewise, the bezel bracket to be fitted to the left hand side of the rack, when the rack is viewed from the front, is stamped with the letter "L".
- 2 Turn a bezel bracket so that the stamped letter is correctly orientated and is facing the front, and the indents face outward towards the side of the rack as shown on Figure 5b.
- 3 Attach the bracket to the flange of one of the side mounting brackets.
The two rectangular holes on the bezel bracket hang on the two teeth of the side mounting brackets, as shown in Figure 5b.
- 4 Insert two M6 mounting screws through the slotted holes on the rear flange of the bezel bracket, so that the screws pass through the aligned slotted holes in the side mounting bracket and locate into cage nuts installed on the front rack column.
- 5 Repeat paragraphs 2 through 4 with the other bezel bracket.
- 6 Remove the bezel endcaps by removing two screws and unsnapping them from the bezel.

Caution Take care not to damage the LEDs on the top right hand side of the enclosure when fitting the front bezel.

- 7 Align the lower three mushroom snaps on both ends of the bezel with the holes on the bezel brackets (the top mushroom snap on each side is not used). Ensuring that the centre locating lug is also aligned and that the top edge of the bezel slides over the top front edge of the enclosure, snap the bezel into place. (No screws are required.)

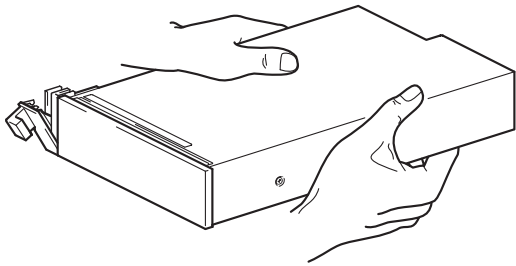


Figure 6a: Handling a half-height tape drive module

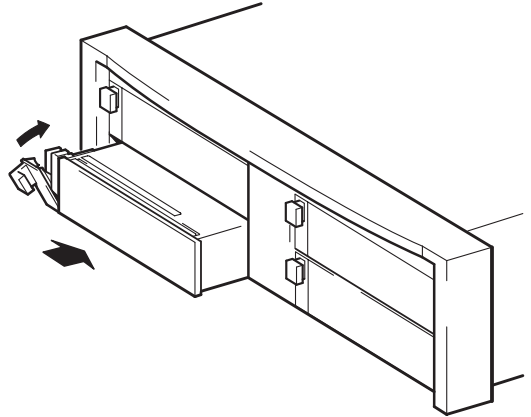


Figure 6b: Installing a half-height tape drive module

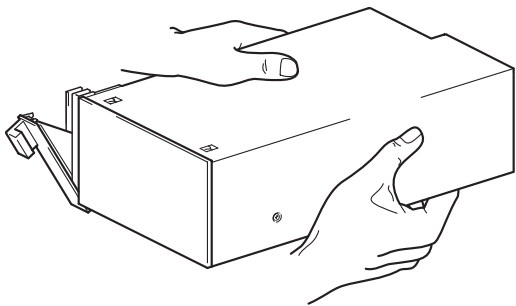


Figure 6c: Handling a full-height tape drive module

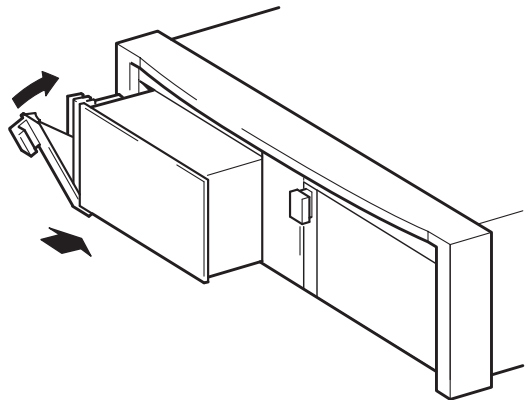


Figure 6d: Installing a full-height tape drive module

Step 6: Install the tape drive module

The tape drive modules for the HP Tape Array 5300 are offline hot-swappable. Tape modules can be installed into bays before or after the tape array is powered up. The HP Tape Array 5300 can accept up to four half-height tape drives or two full-height tape drives.

Installing the tape drive module

Warning To minimize the weight and prevent personal injury you should install the HP Tape Array 5300 into the rack cabinet (as described on page 15 or page 17) before you install the tape drive modules.

- 1 Before installing a tape drive module, make sure that the extractor lever is in the fully open position (pulled out).

Caution When handling a tape drive module, hold the module by the side carrier framework as shown on Figures 6a and 6c. To avoid possible damage, do not hold the body of the module and do not push or pull on the tape drive module's front panel.

- 2 Slide the tape drive module into one of the open bays, ensuring that the guide rails on both sides of the module locate into the slots on the partition wall as shown on Figures 6b and 6d. Carefully but firmly ensure the tape drive module is pushed fully in so that the rear connectors are securely seated. The extractor level will close slightly.

Note Correct alignment of SCSI modules in the tape array is essential to ensure a secured connection is made between the interface of the module and the interface of the array.

- 3 Push on the extractor lever to complete the insertion and to lock the tape drive module in place.

Caution It is very important to ensure blanking plates are fitted if less than the full compliment of modules are installed. Failure to do so may affect tape drive performance.

- 4 If there are less than four half-height (or two full-height) modules installed, insert a blanking plate into the empty bays. This is essential to ensure adequate airflow is maintained.

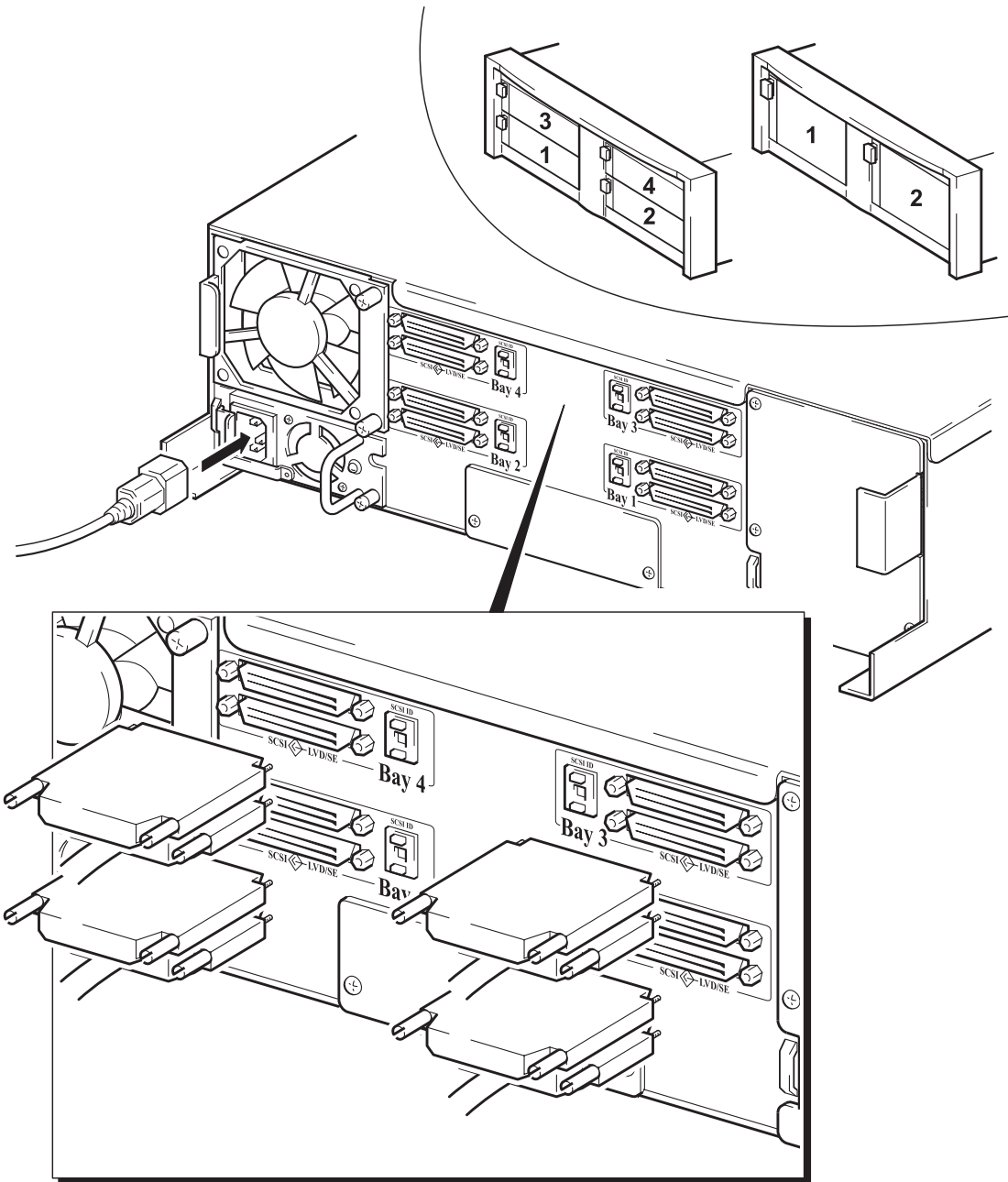


Figure 7: Power, SCSI, and terminator connections

Step 7: Connect the SCSI cables, terminator and power cord

- 1 There are two SCSI connectors on the rear panel of each drive module bay (marked bays 1 to 4). The layout of the four pairs of connectors align with the position of the four half-height tape drive modules in the HP Tape Array 5300 when viewed from the back. For example, the SCSI connectors to the bottom right, when viewed from the back, (bay 1) correspond to the tape drive module installed in the bottom left bay, when viewed from the front. Where full-height drives are installed, only the lower SCSI connectors (bays 1 and 2) should be used.

The standard configuration is a direct one-to-one SCSI connection between a tape drive module and a host server, as shown in Figure 7.

Connect one end of an appropriate LVD/SE SCSI cable (of the correct length) to one of the SCSI connectors for the bay selected on the rear panel of the HP Tape Array 5300.

SCSI cables must be ordered separately. To select a cable appropriate for your application, refer to your local HP sales office or view the cable options listed on the HP support web site <http://www.hp.com/support/tapearray>.

- 2 Connect the other end of the SCSI cable to the host server.
- 3 Install an appropriate SCSI LVD/SE terminator to the other SCSI connector for the bay selected on the rear panel of the tape array.

SCSI terminators must be ordered separately. To select a terminator appropriate for your application, refer to your local HP sales office or view the terminator options listed on the HP support web site <http://www.hp.com/support/tapearray>.

- 4 Repeat paragraphs 1 through 3 for the remaining tape drive modules.

If other devices are installed on the same SCSI bus, the last device on the bus should be terminated. A tape module should not be connected to the same bus as disk devices or any other non-LVD SCSI tape peripherals.

Note It is also possible to daisy-chain two drive modules together. Contact your local HP sales office, for information on how to order appropriate SCSI cables and terminators. For more information, see "Advice on daisy-chaining" on page 31.

- 5 Install the power cord to the socket on the power supply unit (lower left side of the rear panel).

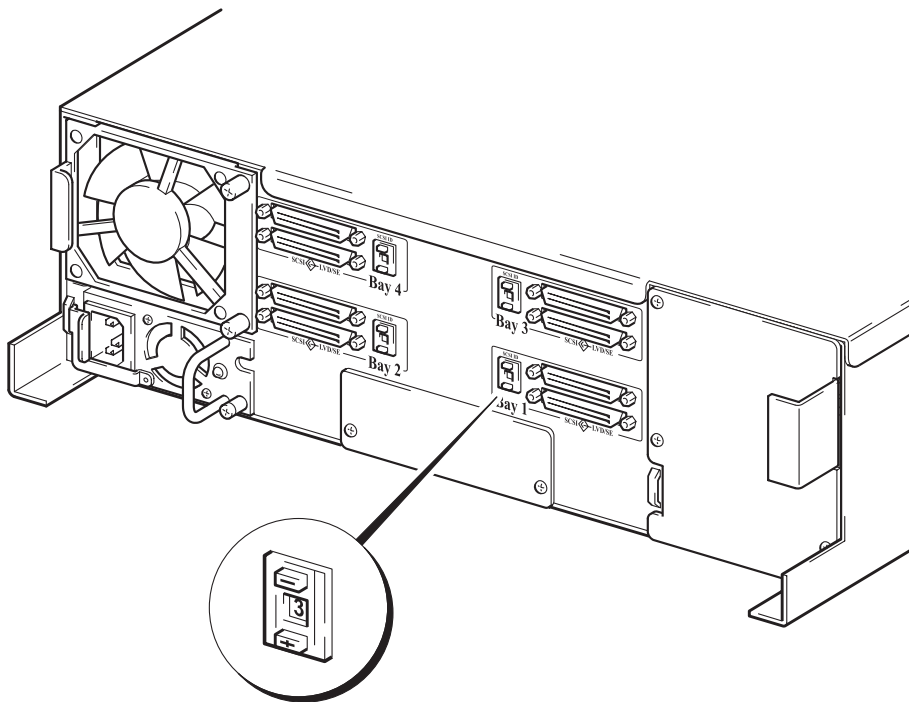


Figure 8: Rear panel view

Step 8: Set the SCSI ID

The rear panel consists of a removable fan, a removable power supply, a power connector, four SCSI In connectors, four SCSI Out connectors, and four SCSI ID switches. See Figure 8.

To set the drive's SCSI ID you need to set the appropriate switch on the panel:

- 1 Decide which SCSI ID to use and determine whether you need to change the SCSI ID from the default. SCSI ID 7 is normally reserved for the SCSI controller.

Note Each device on the same SCSI bus should have a unique SCSI ID. When daisy-chaining two tape drive modules together or installing other devices onto the bus, ensure that a different number is chosen for each device on the same bus.

It is not necessary to have different numbers where the tape drive modules are configured in direct one-to-one connection with the host servers and no other devices are installed on the bus.

You can install HP Library and Tape Tools from the HP StorageWorks Tape CD-ROM supplied with your tape drive modules or from our world wide web site at <http://www.hp.com/support/tapetools>. Use HP Library and Tape Tools and run "Install Check" to check your computer's current SCSI configuration. (This is only available on Windows NT4, Windows 2000, and Novell NetWare operating systems.)

- 2 Change the tape array's four SCSI ID switches, if necessary.

Use a ball-point pen or similar pointed object to press the indented + or - buttons above and below the SCSI ID number until the required value is displayed.

Guidelines for SCSI Tape Drive Modules

- Each tape drive module that shares the same bus must be assigned a unique SCSI ID before the unit is powered up.
- The last device on the bus must be terminated using a low voltage differential (LVD) terminator.
- A diagnostic application, such as HP Library and Tape Tools, can be used to help troubleshoot detection issues of SCSI modules.

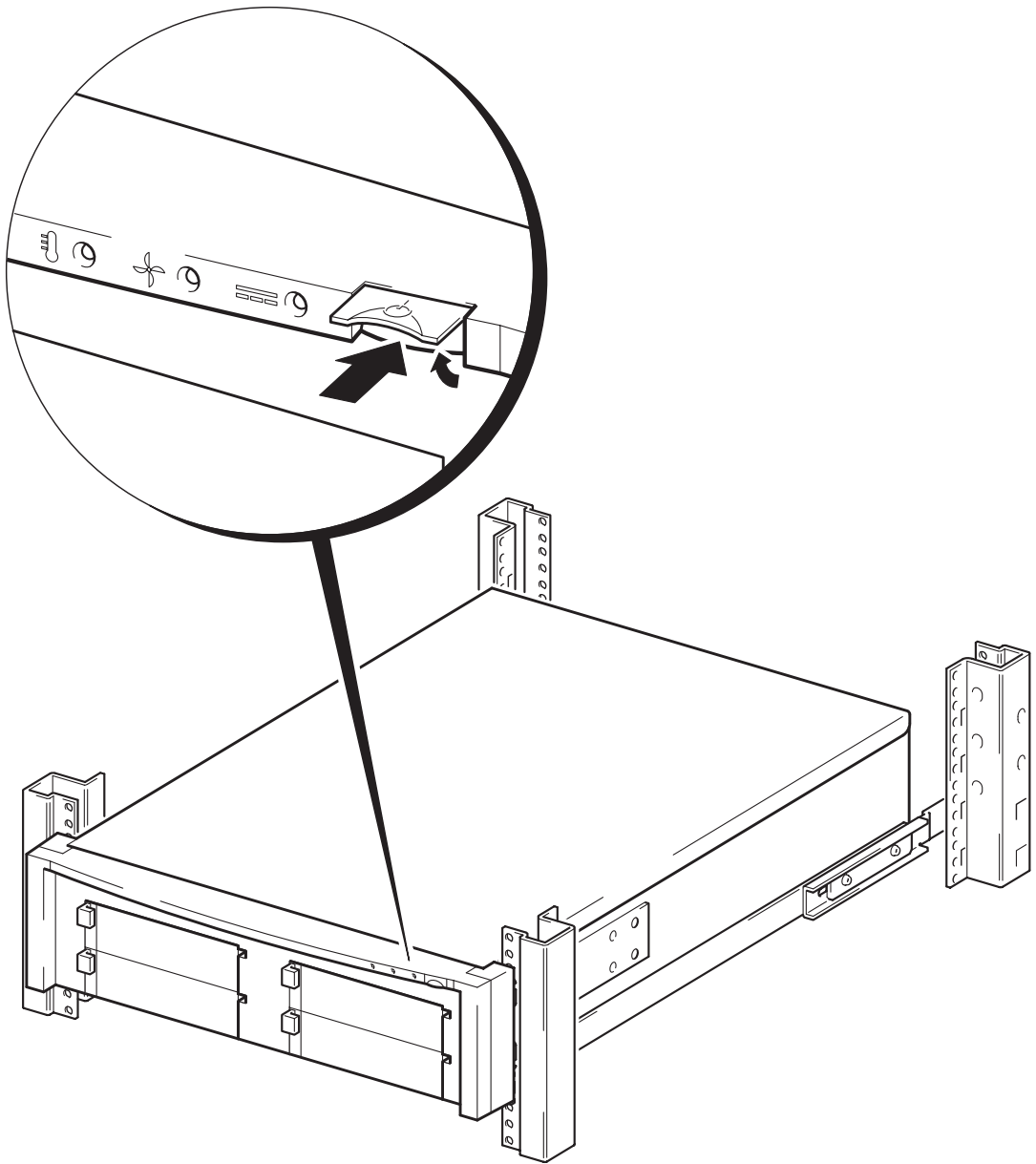


Figure 9: Front bezel with LED indicators

Your HP Tape Array 5300

Switching on the unit

The HP Tape Array 5300 main power switch is located on the front bezel. Lift the hinged flap and depress the switch to power on the unit.

Front panel LEDs

There are three LEDs on the front bezel. They indicate the temperature, fan and power supply status of the tape array. These LEDs are shown in Figure 9 and are described in the table below:

Indicator	LED color - solid green	LED color - flashing red
Temperature LED	Temperature within safe operating limit for enclosure.	Temperature above safe operating limit for enclosure.
Enclosure fan	Fan present and operating correctly.	Enclosure fan has failed.
Power supply unit	PSU is present and has good output.	PSU present, but its output is not functioning correctly. If the PSU has completely failed, all LEDs will be off.

Where the high availability option kit is installed as described on page 35, so that second fan and power supply unit is added to the enclosure, then the LEDs functionality is as described below:

Indicator	LED color - solid green	LED color - flashing red
Enclosure fans	Both fans present and operating correctly.	One or both enclosure fans have failed.
Power supply units	Both PSUs present and have good output.	Both PSUs present, but either the output at one or both PSUs is not functioning correctly, or one PSU has completely failed.

Rear panel LEDs

The power supply unit has an integral green LED, visible from the rear panel. When lit, the LED indicates that power is on.

Note Each tape drive module also has LEDs on the front panel to monitor the functions of the tape drive itself. Refer to the User's Guide shipped with the tape drive module to understand the status of these LEDs. (The LEDs on the front bezel of the HP Tape Array 5300 apply to the temperature, fan, and power functions of the enclosure only.)

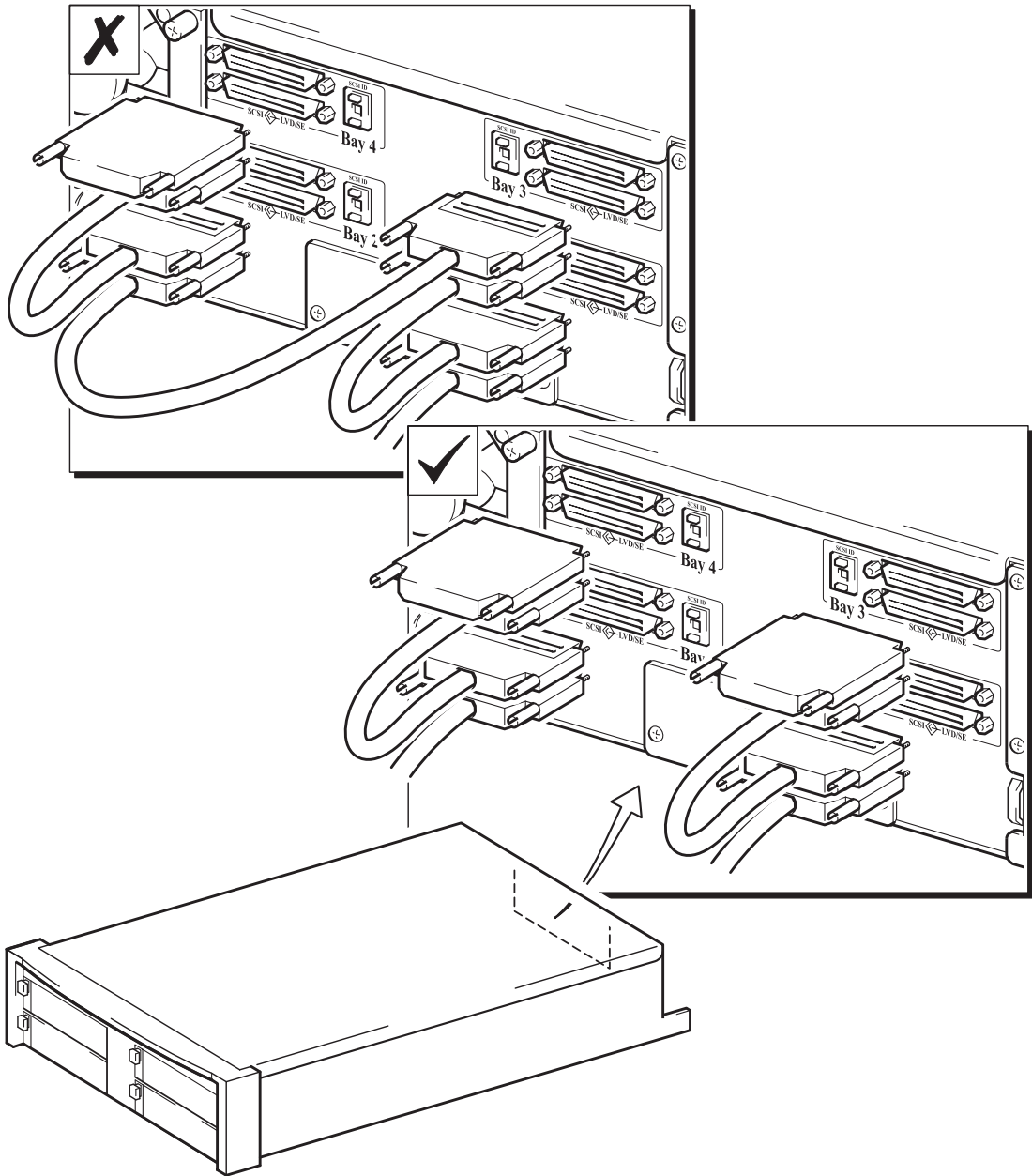


Figure 10: Daisy-chaining two drive modules

Advice on daisy-chaining

HP recommends that tape drive modules, as supplied for the HP Tape Array 5300, should not be placed on a SCSI bus with more than one other module ("daisy-chained"), as illustrated in Figure 10.

Daisy-chaining more than two devices together will not usually result in the drives failing but may degrade their individual performance with respect to transfer rate. This is due to the extra overhead of traffic on the SCSI bus. If more than two drives are run from a single server or workstation, additional SCSI adapters should be used for these drives.

To daisy-chain two tape drive modules:

- 1 Connect one end of an appropriate LVD/SE SCSI cable to one of the rear panel SCSI connectors of the first module in the daisy-chain.

SCSI cables must be ordered separately. To select a cable appropriate for your application, refer to your local HP sales office or view the cable options listed on the HP support web site <http://www.hp.com/support/tapearray>.

- 2 Connect the other end of the cable to the host server.
- 3 Take an appropriate short length SCSI cable:
 - Connect one end to the other SCSI connector of the first module.
 - Connect the other end to one of the SCSI connectors of the second module.
- 4 Install an appropriate SCSI LVD/SE terminator to the other SCSI connector of the second module.

SCSI terminators must be ordered separately. To select a terminator appropriate for your application, refer to your local HP sales office or view the terminator options listed on the HP Support web site <http://www.hp.com/support/tapearray>.

- 5 Ensure that the SCSI IDs are unique on each of the two daisy-chained modules.

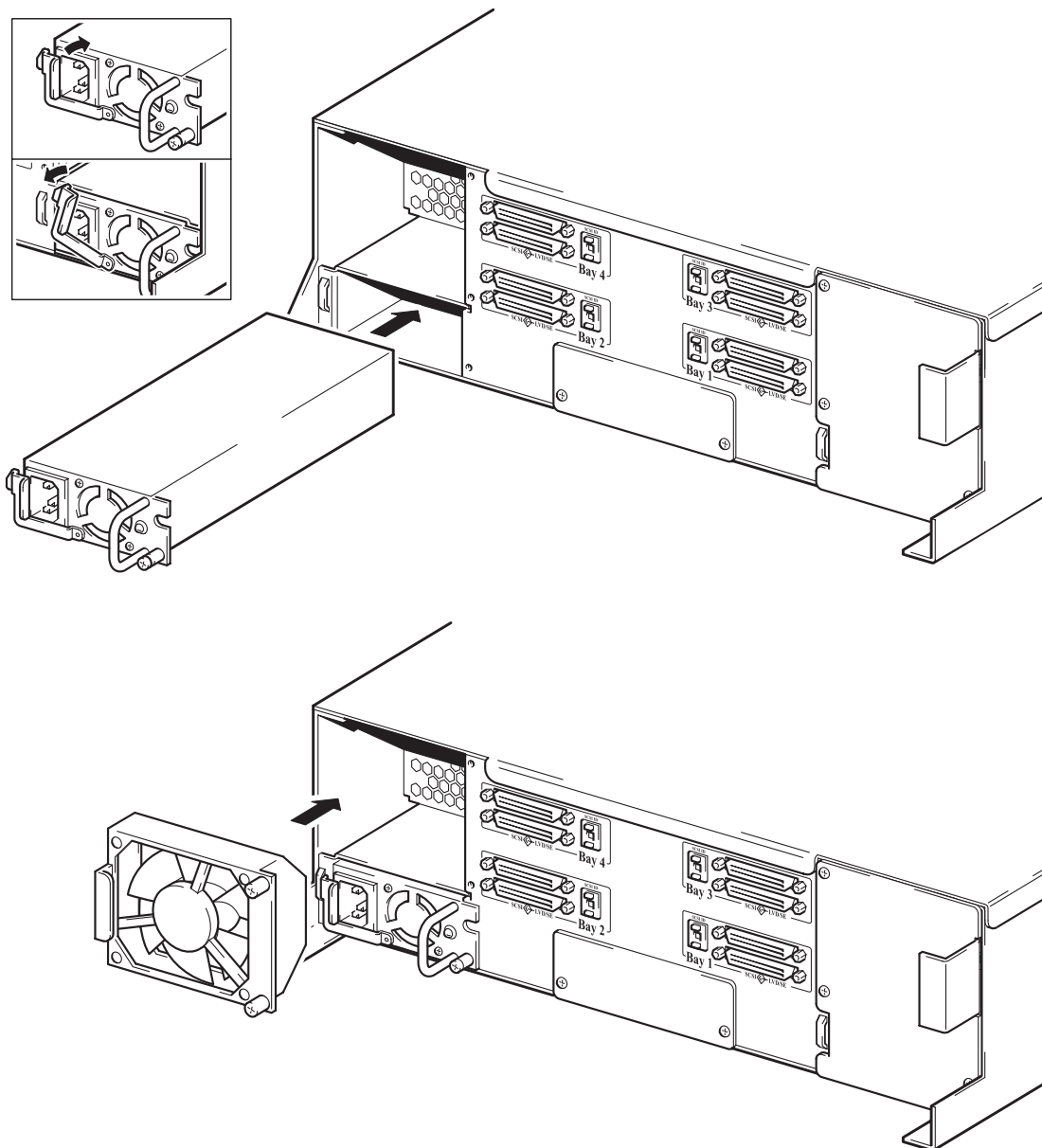


Figure 11: Replace fans and power supply

Replacing a tape drive module, fan, or power supply

The tape drive modules are *offline* hot-swappable¹. The fan and power supply are installed at the factory. Tape modules can be installed into bays before or after the HP Tape Array 5300 is powered up.

Replacing a tape drive

- 1 Before installing a tape drive module, make sure that the extractor lever is in the fully open position (pulled out).
- 2 Slide the tape drive module into one of the open bays until the rear connectors are firmly seated. The extractor level will close slightly.
- 3 Push on the extractor lever to complete the insertion and to lock the tape drive in place.
- 4 If there are less than four half-height (or two full-height) modules installed, insert a blanking plate into the empty bays.

Replacing a fan

- 1 Remove the old fan by unscrewing the two thumb screws. Pull the fan assembly out of its bay.
- 2 Align the replacement fan unit as shown in Figure 11. Slide the fan unit into the opening.
- 3 Tighten both thumb screws to complete the insertion and to lock the fan unit in place.

Replacing a power supply

- 1 Unplug the power cord.
- 2 Unscrew the single securing screw using a correct-size Philips screwdriver. Rotate the locking mechanism clockwise, sufficient to clear the retaining lug, and pull the power supply unit out of its bay, using the handle supplied.
- 3 Align the new power supply unit so that the yellow warning label is uppermost. Insert the power supply unit, which must not have a power cable connected, and slide it into the opening, as shown in Figure 11. Rotate the locking mechanism clockwise, sufficient to clear the retaining lug, and push the unit fully home.
- 4 Rotate the locking mechanism counter-clockwise to engage with the retaining lug and lock the power supply unit in place.
- 5 Tighten the single securing screw.
- 6 Plug in the power cord.

1. Offline hotswap is defined as the ability to plug and unplug drive modules with the power still connected, but not while data transfers are taking place on other drives on the same SCSI bus.

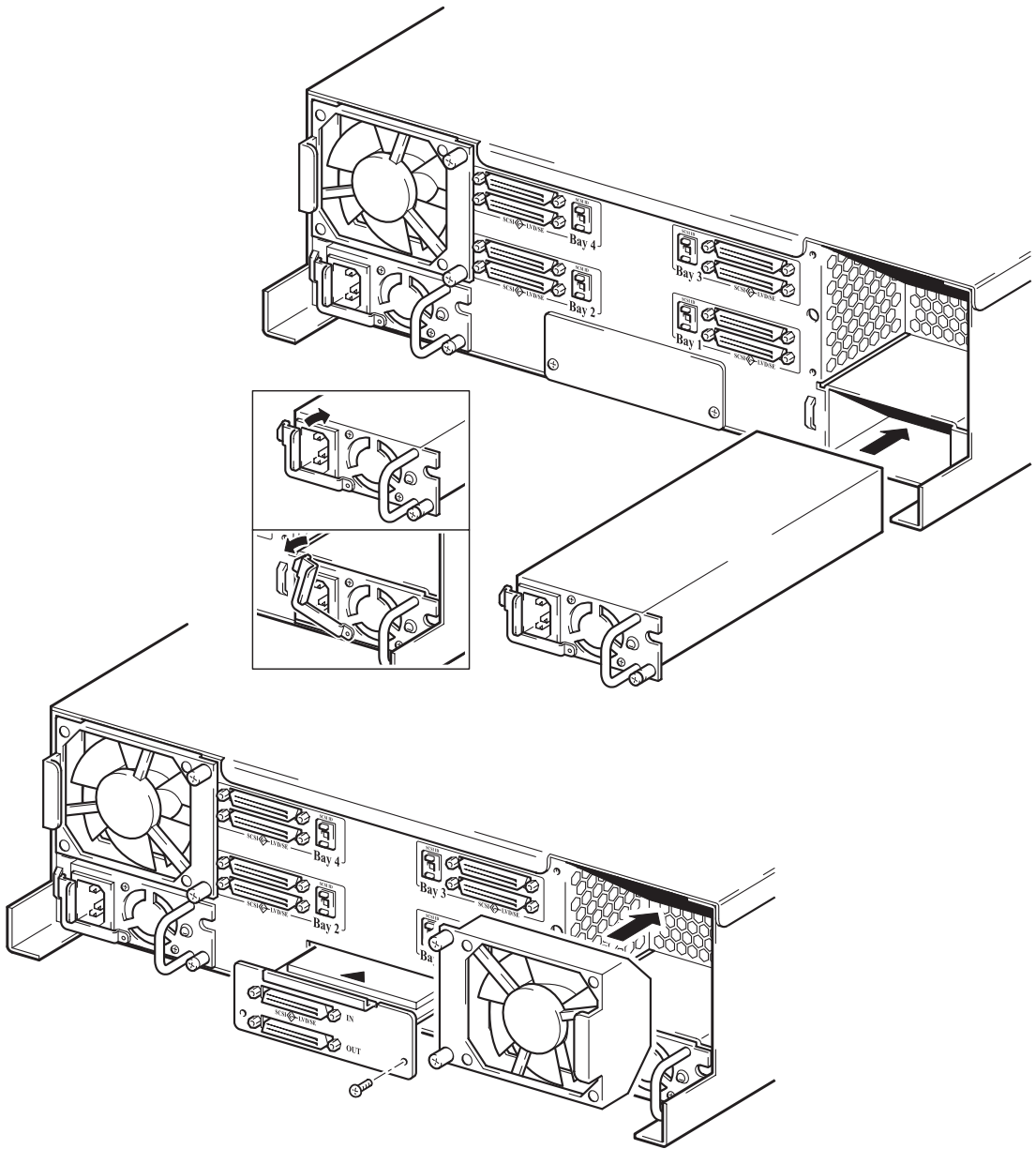


Figure 12: Install upgrade kits

Installing high availability upgrade kit

The HP Tape Array 5300 is shipped with a single fan and power supply unit. An upgrade kit is available to fit an additional fan and power supply unit. This provides high-availability, hot-swap functionality whereby should one unit suffer component failure, the other unit will maintain correct operation.

To power down the HP Tape Array

Ensure that all tape drive devices have finished any backup or restore activities and that no data transfers are taking place between the HP Tape Array 5300 and its Host device(s).

To install an update kit, first power down the tape array as follows:

- 1 Lift the power button safety cover on the front bezel and depress the power button.
- 2 Remove the main cable connection from the power supply on the lower left hand side of the rear panel. This is essential - the tape array's electronics always have some standby power applied unless the power cord is detached. Check that the HP Tape Array 5300 is fully powered down - all LEDs on the front panel should be unlit.

To install the high availability upgrade kit

- 1 Remove the blanking plate on the right hand side of the tape array's rear panel and install the second fan and power supply unit into their respective slots, as detailed on page 33.
- 2 Connect mains power cables to both power supply units, and restart the tape array by pressing the power on/off button ON at the front bezel. Check that all three LEDs are GREEN. If all three LEDs are not shown Green, refer to the troubleshooting section on page 36.

Troubleshooting the HP Tape Array 5300

The first step in problem-solving is establishing whether the problem lies with the HP Tape Array 5300, its connections to the host computer, or with the removable tape drive modules.

Warning The power button does not power off the unit completely although the power supply and fan(s) are off. The HP Tape Array 5300 electronics always have some standby power applied unless the power cord(s) is detached.

If the problems relate to poor performance, refer to your backup application manual.

If none of this advice helps you solve the problem, call for technical support. The HP technical support numbers are available on the web site: [//www.hp.com/support](http://www.hp.com/support). They are also listed on the HP StorageWorks CD-ROM supplied with the tape drive modules.

Physical Installation

Possible reason	Recommended action
The side support rails do not fit the cabinet.	<ul style="list-style-type: none">• Adjust the length of the rails to fit the cabinet.• Verify the compatibility of the rack used.• Check the template for the correct assembly procedure.
The fixing screws used to attach the side support rails to the cabinet are of the wrong type.	Check the screws are the recommended type for the cabinet. There are two types supplied: M5 screws that locate into clip nuts for racks with round profile holes in the cabinet columns and M6 screws that locate into cage nuts for racks with square profile holes in the cabinet columns.
The enclosure cannot be pushed fully in.	<ul style="list-style-type: none">• Verify the tabs on the rails are not damaged.• Check the template for the correct assembly procedure.• Check the rails are at 90° to the cabinet columns and are fully-tightened up.
The slots in the side mounting brackets do not align with the holes in the cabinet columns.	Check the fittings on the cabinet column with the template for the correct position.
The front bezel does not snap-fit onto the bezel brackets.	<ul style="list-style-type: none">• Check for correct orientation of the bezel-mounting bracket on the main enclosures.• Check that the front bezel's central locating lug is correctly aligned and that the top edge of the bezel fits over the top edge of the enclosure.
The front bezel protrudes too far out of the enclosure.	Check that the side mounting brackets have been repositioned so that the second set of holes on the brackets align with the holes in the tape array's chassis.

Installing the tape drive modules

Possible reason	Recommended action
The tape drive modules do not insert properly.	<ul style="list-style-type: none">• Check that the extractor lever is in the fully open position before inserting the module.• Check that the guide rails on both sides of the module are correctly located in the slots in the drive bay's partition walls.• Check the module for damage or for any object preventing insertion.• Check that the drive bay is clear of any obstruction.• Check that the connections on both the module and the bay are not damaged.
The blanking panels do not fit into unpopulated drive bays.	Check that the blanking panels are not damaged.
The SCSI cables or SCSI terminators do not fit onto the SCSI connections on the rear panel of the tape array.	<ul style="list-style-type: none">• Check that the cables and/or terminators are the correct type and size.• Check the cables, terminators and rear panel connectors for damage.

The tape drive modules are not responding

Possible reason	Recommended action
The tape drive module(s) is not functioning.	<ul style="list-style-type: none">• Check that the power cable(s) is firmly connected.• Check that the power supply is operating.• Ensure that the module is fully-seated into the rear connectors of the tape array.
The tape drive module(s) is not seen by the host controller.	<ul style="list-style-type: none">• Check that the SCSI host adapter has been correctly installed in the host system.• Check that all SCSI buses are terminated correctly.• Make sure that all SCSI cables are connected firmly.• Remove the SCSI cables and check for damaged contacts or pins. Replace or reinstall the cables.• Remove and reseat the tape drive modules.• Remove and change the position of the modules in the drive bays.
There is a communication problem on the SCSI bus.	<ul style="list-style-type: none">• Check the SCSI cabling.• Refer to the SCSI topic of the tape drive module's User's Guide (on the HP StorageWorks Tape CD-ROM).• Run HP Library and Tape Tools.

Problems with the LEDs

Possible reason	Recommended action
Both the power supply unit's LEDs and the front bezel LEDs do not light.	<ul style="list-style-type: none"> • Check that the power cable(s) is firmly connected and the power is switched on. • Cycle the power to the tape array. • Check the main fuse. • Replace the power supply unit and call for service if the LEDs still do not light.
The power supply unit's LED is on, but the front bezel LEDs do not light.	<ul style="list-style-type: none"> • Check that the front bezel is properly assembled. • Check that the power-on button on the front bezel is pushed in to the full extent of its travel.
The LEDs on the tape drive module(s) do not light.	<ul style="list-style-type: none"> • Check the module is fully seated into the rear of the tape array. • Check the connectors on the tape drive module for signs of physical damage. • Refer to the documentation supplied with the tape drive module for details on the correct operation of the module's front panel LEDs.
The Temperature LED is flashing red.	<ul style="list-style-type: none"> • Check that the fan(s) is working • Check that blanking panels are in place in any unpopulated drive bays. • Check that the tape array is operating within its environmental specifications. • Check that adjacent devices in the cabinet are not overheating. • Check that there are no obstructions blocking the flow of air at the rear or front of the unit.
The Fan LED is flashing red.	<ul style="list-style-type: none"> • Check that the fan(s) is properly located. • Check that the fan(s) is rotating. If it is not rotating, remove the fan and try repositioning it in the opposite bay. If it is rotating, remove it and check for obstructions. Clean the fan before replacing.
The Power Supply Unit is flashing red.	<ul style="list-style-type: none"> • If there is only one PSU, and the LED on the PSU is lit, remove the PSU and try repositioning it in the opposite bay. • If there is a second PSU present, remove the left hand unit and power cycle the enclosure. Swap the PSU within the same unit and re-power cycle the unit.
The tape drive module's LED show a fault condition	<ul style="list-style-type: none"> • Cycle the power for the module. • Refer to the module's User's Guide.

Product Specifications

HP Tape Array 5300 specifications

SCSI Buses	4 individual buses (daisy-chain capable); LVD (Low Voltage Differential)
SCSI Connectors	Eight 68-pin SCSI connectors
SCSI Bus bandwidth	80 MB/s
Rack space used	3U
Power and fan	Redundant and hot-swappable
SCSI Device types supported	Synchronous or asynchronous
Supported NOS	Refer to: http://www.hp.com/go/connect
Supported software	Refer to: http://www.hp.com/go/connect
LED interface	Temperature, power supply, and fan
Height	3U = 133.35 mm (5.25 inches)
Width of enclosure	444.5 mm (17.5 inches)
Width of enclosure plus bezel	480 mm (18.9 inches)
Depth of enclosure	710.5 mm (28 inches)
Depth of enclosure plus bezel	740.5 mm (29.2 inches)
Weight empty of tape drives but with 1 fan and 1 PSU installed	13 kg (28.7 lbs)
Weight fully-populated with half-height tape drives and with front bezel in place	23kg (50.72 lbs) typical - exact weight will vary with type of tape drive modules installed.
Weight fully-populated with full-height tape drives and with front bezel in place	21 kg (46.31 lbs) typical - exact weight will vary with type of tape drive modules installed.

Operating and non-operating ranges

Temperature	Operating:	5°C to 40°C
	Non-operating	-40°C to 70°C
Humidity	Operating:	20% – 80% non-condensing
	Non-operating	5% – 95% non-condensing
Vibration	Operating random:	0.21 grms, 5-500 Hz
	Survival random: Power off	2.09 grms, 5-500 Hz
Altitude	Operating:	0m to 3.1 km (0 to 10,000 ft)
	Non-operating	0m to 4.6 km (0 to 15,000 ft)

These figures apply to the tape array enclosure only. Refer to the documentation supplied with the tape drive modules for operating parameters for the modules.

